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Current and Lifetime Psychiatric Disorders among Veterans with War Zone-Related Posttraumatic Stress Disorder

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Previous research has found high rates of psychiatric disorders among veterans with war zone-related posttraumatic stress disorder (PTSD). However, many studies in this area are methodologically limited in ways that preclude unambiguous interpretation of their results. The purpose of this study was to address some of these limitations to clarify the relationship between war zone-related PTSD and other disorders. Participants were 311 male Vietnam theater veterans assessed at the National Center for PTSD at the Boston Veterans Affairs Medical Center. The Clinician-Administered PTSD Scale and the Structured Clinical Interview for DSM-III-R were used to derive current and lifetime diagnoses of PTSD, other axis I disorders (mood, anxiety, substance use, psychotic, and somatoform disorders), and two axis II disorders (borderline and antisocial personality disorders only). Participants also completed several self-report measures of PTSD and general psychopathology. Relative to veterans without PTSD, veterans with PTSD had significantly higher rates of current major depression, bipolar disorder, panic disorder, and social phobia, as well as significantly higher rates of lifetime major depression, panic disorder, social phobia, and obsessive-compulsive disorder. In addition, veterans with PTSD scored significantly higher on all self-report measures of PTSD and general psychopathology. These results provide further evidence that PTSD is associated with high rates of additional psychiatric disorders, particularly mood disorders and other anxiety disorders. The implications of these findings and suggestions about the direction of future research in this area are discussed.

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A growing number of clinical and community studies have found that war zone-related posttraumatic stress disorder (PTSD) is associated with high rates of concurrent psychiatric disorders, particularly mood disorders, substance use disorders, and other anxiety disorders (*e.g.*, Faustman and White, 1989; Kulka et al., 1990; Sierles et al., 1986). This comorbidity has important implications both for the classification of PTSD and for the assessment and treatment of afflicted veterans. First, high rates of comorbid diagnoses challenge the conceptualization of PTSD as a distinct diagnostic entity (*e.g.*, March, 1990). Second, the presence of multiple diagnoses impacts on assessment, requiring clinicians to make complex decisions regarding differential diagnoses. Finally, comorbidity complicates the course of treatment, necessitating additional interventions and a complex, hierarchical approach to selecting targets for change (Boudewyns et al., 1991; Pitman et al., 1991).

Unfortunately, many of the previous comorbidity studies among veterans have methodological limitations that preclude definitive conclusions about the relationship between war zone-related PTSD and other disorders. Most importantly, the majority of studies did not include a comparison group of patients without PTSD (*e.g.*, Boudewyns et al., 1991; Davidson et al., 1985; Roszell et al., 1991; Sierles et al., 1986). Without this comparison group, it is impossible to determine if high rates of comorbidity are specific to PTSD. In addition, several studies examined comorbidity in small samples of veterans, which limits the replicability of their findings (*e.g.*, Behar, 1984; Escobar et al., 1983; Sierles et al., 1983). Also, many investigators either failed to use standardized diagnostic procedures (*e.g.*, Faustman and White, 1989; Hryvniak and Rosse, 1989; McFarland, 1985), or they relied on the Diagnostic Interview Schedule (DIS) for their assessment of PTSD (*e.g.*, Centers for Disease Control, 1988) or

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TABLE 1
Participants' Demographic Characteristics

Characteristic	*N* (%)
Marital Status	
Never married	81 (27)
Married/cohabiting	78 (26)
Separated	38 (13)
Divorced	67 (23)
Remarried	28 (9)
Widowed	5 (2)
Race	
Caucasian	239 (80)
African-American	48 (16)
Hispanic	5 (2)
Other	7 (2)
Education	
Some high school	16 (6)
High school diploma	63 (25)
Vocational school	31 (12)
Some college	105 (41)
College degree	32 (12)
Graduate degree	10 (4)

associated comorbid axis I disorders (*e.g.*, Kulka et al., 1990). There is some evidence that the DIS does not correspond well with clinically derived diagnoses (Anthony et al., 1985; Erdman et al., 1987). Further, many studies failed to present data on both lifetime and current rates of associated psychiatric disorders (Faustman and White, 1989; Hryvniak and Rosse, 1989). Evidence regarding both lifetime and current prevalence is important for furthering our understanding of patterns of comorbidity in this population. Finally, many previous studies did not assess or report the full range of axis I disorders (Engdahl et al., 1991; Kulka, et al., 1990). An evaluation of the comorbidity of the full range of other anxiety disorders in PTSD is particularly important given the high rate of symptom overlap and syndrome comorbidity known to exist among the other anxiety disorders (Sanderson et al., 1990).

To date, the most methodologically advanced studies examining the prevalence of psychiatric disorders among veterans with war zone-related PTSD have been those that used community-based probability sampling strategies (*e.g.*, Centers for Disease Control, 1988; Kulka et al., 1990). The present study attempts to clarify the relationship between war zone-related PTSD and other psychiatric disorders among service-seeking veterans by addressing some of the methodological difficulties of previous studies. Using structured clinical interviews, the full range of current and lifetime axis I disorders as well borderline (BPD) and antisocial personality disorders (ASPD), were examined in a large sample of Vietnam combat veterans with and without a current diagnosis of war zone-related PTSD.

Method

Participants

Participants were 311 male Vietnam theater veterans seen for clinical services or research participation at the National Center for PTSD at the Boston Veterans Affairs Medical Center. As shown in Table 1, the majority of participants were Caucasian (80%), were separated/divorced or never married (63%), and had completed at least some college (57%). Mean age ± SD was 44.5 ± 3.05 years. One hundred ninety-seven veterans (63%) met DSM-III-R criteria for current PTSD. Participants with and without PTSD did not differ on any demographic characteristics.

Procedure

Information about current and lifetime diagnostic status was obtained through structured clinical interviews. PTSD diagnoses were derived either from the PTSD module of the Structured Clinical Interview for DSM-III-R (SCID; Spitzer et al., 1989) or the Clinician-Administered PTSD Scale (CAPS; Blake et al., 1990). Diagnoses of all other axis I disorders including mood, anxiety, substance use, psychotic, and somatoform disorders were derived from the SCID (Spitzer et al., 1989). Diagnoses of two axis II disorders, BPD and ASPD, were derived from the SCID-II (Spitzer et al., 1990). All diagnoses were assigned in accordance with DSM-III-R (American Psychiatric Association, 1987) diagnostic criteria. Although no formal reliability data were collected in this study, both the SCID (Kulka et al., 1991; Williams et al., 1992) and the CAPS (Weathers and Litz, 1994) have been shown to have good interrater reliability. For the present study, all interviews were administered by doctoral-level clinicians experienced in the use of these instruments.

In addition, participants completed the Combat Exposure Scale (Keane et al., 1989) and several self-report measures of PTSD and general psychopathology, including the Mississippi Scale for Combat-Related PTSD (Keane et al., 1988), the MMPI-PK scale (Keane et al., 1984), the Beck Depression Inventory (Beck et al., 1961), and the State-Trait Anxiety Inventory (Spielberger et al., 1970).

Results

Self-report Measures

Differences between veterans with and without PTSD in reported severity of combat exposure, PTSD symptomatology, and general psychopathol-

ogy were analyzed using two-tailed independent sample *t*-tests. As seen in Table 2, veterans with PTSD scored significantly higher on all self-report measures than did veterans without PTSD. Predictably, the PTSD group reported significantly greater combat exposure and PTSD symptomatology.

TABLE 2

A Comparison of Veterans with and without PTSD on Psychological Inventories

	PTSD +		PTSD −		
	N	Mean ± SD	*N*	Mean ± SD	*t**
BDI	183	28.99 ± 11.21	109	15.50 ± 10.33	10.22
CES	192	25.60 ± 10.29	105	17.92 ± 10.36	6.14
M-PTSD	194	127.09 ± 18.17	112	91.24 ± 21.61	15.49
STAI-T	186	58.77 ± 9.93	109	45.51 ± 12.60	9.40
STAI-S	184	60.52 ± 13.69	107	46.33 ± 13.69	9.09
PK	192	31.82 ± 9.16	110	18.49 ± 10.69	11.44

*$p < .01$.

BDI, Beck Depression Inventory; CES, Combat Exposure Scale; M-PTSD, Mississippi Scale for Combat-related PTSD; STAI-T, State Trait Anxiety Inventory-Trait Version; STAI-S, State-Trait Anxiety Inventory-State Version; PK, MMPI-2 PTSD Keane scale.

Prevalence of Comorbid Diagnoses

Chi-square tests (or Fisher's exact test when appropriate) were used to evaluate differential prevalence between PTSD and non-PTSD veterans for each disorder assessed. Although the overall sample size was 311, the number of participants available for each pair-wise comparison varied because of missing data. For analyses involving an individual disorder (*e.g.*, panic disorder), participants were excluded from analyses if they had missing data for that disorder. For analyses involving a group of disorders (*e.g.*, any anxiety disorder), participants were excluded if they had missing data for any of the individual diagnoses included in that group. Thus, to determine the proportion of participants meeting the criteria for any anxiety disorder, only those who had complete diagnostic data for all anxiety disorders were included. Using this method of handling missing data,[4] the fewest number of participants were available for comparisons of the broadest category (any axis I disorder).

Current Comorbidity

Significantly more PTSD veterans met criteria for at least one current axis I disorder (excluding PTSD) than did non-PTSD veterans (82% *vs.* 54%; $\chi^2 = 19.45$, $p < .01$). The prevalence rates of current axis I disorders (by disorder) in veterans with and without PTSD are presented in Table 3. The most prevalent current axis I disorders among veterans with current PTSD were major depression (55%), panic disorder (25%), alcohol abuse or dependence (18%), and social phobia (15%). The most prevalent current axis I disorders among veterans without PTSD were major depression (21%), alcohol abuse or dependence (17%), dysthymia (11%), and panic disorder (9%).

At the diagnostic category level, veterans with PTSD were significantly more likely to meet current criteria for any mood disorder (68%) relative to veterans without PTSD (30%; $\chi^2 = 39.80$, $p < .01$). Further, PTSD veterans were significantly more likely to meet current criteria for any anxiety disorder (46% *vs.* 27%; $\chi^2 = 9.02$, $p < .01$). The groups did not differ significantly with respect to the categories of any current substance use disorder, any somatoform disorder, or any psychotic disorder.

At the individual diagnosis level, veterans with PTSD had significantly higher rates of current major depression (55% *vs.* 21%; $\chi^2 = 32.05$, $p < .01$), bipolar disorder (7% *vs.* 2%, $\chi^2 = 4.36$, $p < .01$), panic disorder (25% *vs.* 9%; $\chi^2 = 11.67$, $p < .01$), and social phobia (15.% *vs.* 7%; $\chi^2 = 4.19$, $p < .04$) than did veterans without PTSD. There were no significant differences between the groups in the rates of dysthymia, agoraphobia without panic, simple phobia, obsessive-compulsive disorder, generalized anxiety disorder, or any individual substance use, somatoform, or psychotic disorder.

Lifetime Comorbidity

Lifetime prevalence data on dysthymia, generalized anxiety disorder, and the somatoform disorders are not available, as these disorders are only assessed for current status on the SCID. In determining overall lifetime rates of any axis I disorder, however, the current presence of these disorders was counted as present for lifetime status. Virtually all veterans with PTSD (98%) met criteria for at least one other disorder in their lifetime. However, this rate was comparable to the rate of psychopathology within the non-PTSD group (100%).

The prevalence rates of lifetime axis I disorders in veterans with and without PTSD are presented in Table 4. The most prevalent lifetime disorders among the PTSD veterans were alcohol abuse or dependence (77%), major depression (70%), drug abuse or dependence (59%), and panic disorder (28%). The most prevalent lifetime disorders among veterans without PTSD were alcohol abuse or dependence (79%), drug abuse or dependence (64%), major depression (49%), and simple phobia (12%).

As with the current prevalence rates, veterans with PTSD were significantly more likely to meet

TABLE 3
Rates of Current Axis I Disorders by Current PTSD Status

	PTSD + N (%)	PTSD − N (%)	χ^2
Any axis I disorder	111/135 (82)	44/81 (54)	19.45**
Any mood disorder	125/183 (68)	33/109 (30)	39.80**
Major depression	106/194 (55)	24/112 (21)	32.05**
Bipolar disorder	14/192 (7)	2/113 (2)	4.36*
Dysthymia	21/187 (11)	12/112 (11)	.02
Any anxiety disorder	73/160 (46)	27/100 (27)	9.02**
Panic disorder	49/196 (25)	10/111 (9)	11.67**
Agoraphobia w/o panic	5/192 (3)	6/108 (6)	Fisher
Social phobia	29/192 (15)	8/112 (7)	4.19*
Simple phobia	17/175 (10)	9/106 (9)	.12
Obsessive-compulsive disorder	8/173 (5)	1/106 (1)	Fisher
Generalized anxiety disorder	11/163 (7)	3/104 (3)	1.91
Any substance use disorder	44/194 (23)	22/113 (20)	.44
Alcohol abuse/dependence	34/194 (18)	19/113 (17)	.03
Drug abuse/dependence	20/192 (10)	9/110 (8)	.40
Any somatoform disorder	4/155 (3)	0/90 (0)	Fisher
Somatization	0/156 (0)	0/90 (0)	—
Somatoform pain disorder	3/156 (2)	0/90 (0)	Fisher
Undifferentiated somatoform disorder	0/156 (0)	0/90 (0)	—
Hypochondriasis	1/155 (1)	0/90 (0)	Fisher
Any psychotic disorder	10/190 (5)	4/110 (4)	.41
Schizophrenia	1/192 (1)	1/110 (1)	Fisher
Schizoaffective disorder	4/191 (2)	2/110 (2)	Fisher
Delusional disorder	2/191 (1)	0/110 (0)	Fisher
Psychotic disorder NOS	3/192 (2)	1/110 (1)	Fisher

*$p < .05$; **$p < .01$.
Fisher, significance level derived from Fisher's exact test. *N* varies due to missing data.

criteria for the categories of any lifetime mood disorder (84% *vs.* 60%; $\chi^2 = 22.88$, $p < .01$) and any lifetime anxiety disorder (52% *vs.* 30%; $\chi^2 = 11.27$, $p < .01$) than were veterans without PTSD. No differences between the two groups were found for the categories of any substance use disorder or any psychotic disorder.

Regarding individual diagnoses, veterans with PTSD had significantly higher lifetime rates of major depression (70% *vs.* 49%; $\chi^2 = 13.22$, $p < .01$), panic disorder (28% *vs.* 12%; $\chi^2 = 11.13$, $p < .01$), social phobia (17% *vs.* 9%; $\chi^2 = 3.91$, $p < .05$), and obsessive-compulsive disorder (6% *vs.* 1%; Fisher's exact test, $p < .04$) as compared with veterans without PTSD. A greater proportion of PTSD-positive veterans met criteria for BPD (12%) than non-PTSD veterans (4%), although this difference failed to reach significance ($\chi^2 = 3.74$, $p = .053$). The two groups did not differ significantly on lifetime rates of bipolar disorder, dysthymia, agoraphobia without panic, simple phobia, obsessive-compulsive disorder, generalized anxiety disorder, ASPD, or any individual substance use or psychotic disorder.

Discussion

In general, these results support previous research indicating that war zone-related PTSD is associated with high rates of psychiatric comorbidity. In this study, veterans with a current diagnosis of PTSD were significantly more likely to meet current and lifetime criteria for an anxiety disorder and a mood disorder than were veterans without PTSD. At the individual diagnosis level, veterans with PTSD had significantly higher current and lifetime rates of major depression, panic disorder, and social phobia than did veterans without PTSD. Further, there were higher current rates of bipolar disorder and lifetime rates of obsessive-compulsive disorder in the PTSD group.

These results differ from many previous studies, however, in that the pattern of comorbidity we found was much more narrow. For instance, the most comprehensive epidemiological study conducted thus far assessing PTSD and associated axis I disorders among veterans, the National Vietnam Veterans Readjustment Study (NVVRS; Kulka et al.,

TABLE 4
Rates of Lifetime Axis I Disorders by Current PTSD Status

	PTSD + *N* (%)	PTSD − *N* (%)	χ^2
Any axis I disorder	119/121 (98)	79/79 (100)	Fisher
Any mood disorder	156/185 (84)	66/111 (60)	22.23**
Major depression	135/193 (70)	56/114 (49)	13.22**
Bipolar disorder	22/194 (11)	6/113 (5)	3.13
Any anxiety disorder	83/161 (52)	30/99 (30)	11.27**
Panic disorder	55/195 (28)	13/111 (12)	11.13**
Agoraphobia w/o panic	6/192 (3)	7/108 (7)	Fisher
Social phobia	33/193 (17)	10/112 (9)	3.9[illegible]
Simple phobia	18/175 (10)	13/106 (12)	.2[illegible]
Obsessive-compulsive disorder	10/174 (6)	1/106 (1)	Fish[illegible]
Any substance use disorder	160/177 (90)	101/109 (93)	.42
Alcohol abuse/dependence	136/177 (77)	86/109 (79)	.17
Drug abuse/dependence	113/191 (59)	70/110 (64)	.5[illegible]
Any psychotic disorder	12/191 (6)	4/110 (4)	.97
Schizophrenia	2/192 (1)	1/110 (1)	Fisher
Schizoaffective disorder	4/192 (2)	2/110 (2)	Fisher
Delusional disorder	2/191 (1)	0/110 (0)	Fisher
Psychotic disorder NOS	4/192 (2)	1/110 (1)	Fisher
Either axis II disorder	26/146 (18)	15/89 (17)	.04
Borderline personality disorder	18/152 (12)	4/90 (4)	3.7[illegible]
Antisocial personality disorder	18/152 (12)	14/92 (15)	.57

*$p < .05$; **$p < .01$.

Lifetime prevalence data on dysthymia, generalized anxiety disorder, and the somatoform disorders are not available because these disorders are only assessed for current status on the SCID. Fisher, significance level derived from Fisher's exact test. *N* varies due to missing data.

1990), found that Vietnam veterans with PTSD had higher rates of *all* lifetime and current axis I disorders than did those without PTSD. In contrast, we found an increased rate of only certain disorders. One possible reason for this discrepancy is a difference in the two samples studied. Whereas the NVVRS used a non-treatment–seeking, community-based sample for their comparison group, this study used service-seeking veterans. Thus, it is likely that our comparison group was more distressed. A second possible reason for the discrepant findings is that this study is based on data derived from structured clinical interviews administered by clinicians, rather than data derived from the DIS administered by laypersons.

Further, we did not find differential prevalence in axis II or substance use disorders between veterans with and without war zone-related PTSD. Several previous studies have found elevated rates of axis II disorders among veterans with war zone-related PTSD, ranging from 11% to 52% (*e.g.*, Kulka et al., 1990; Sierles et al., 1986). Consistent with these findings, almost 18% of our sample met criteria for ASPD or BPD. Our results indicate, however, that these elevated rates are not specific to veterans with PTSD. Although the rate of BPD was higher in our PTSD group, this difference failed to reach a significant level. In addition, our finding that almost 23% of the PTSD group met current criteria for a substance use disorder, although consistent with other studies citing elevated absolute rates of these disorders (*e.g.*, 23% to 76%; Faustman and White, 1989; Sierles et al., 1986), was not significantly different from the rate among our non-PTSD comparison group. Variability across studies in the prevalence of these disorders may be attributable in part to the use of different methods of assessment. However, our findings underscore the importance of including a comparison group to determine the contribution of other demographic variables when interpreting the elevated absolute rates of these disorders among patients with PTSD.

One result that was consistent with other studies (*e.g.*, Kulka et al., 1990; Roszell et al., 1991) was the high rate of depression we found in veterans with PTSD. This is perhaps the most robust finding across all previous studies and the relationship between these two disorders deserves further comment. There are several possible explanations for this consistent finding. The most straightforward interpretation is that the comorbidity of PTSD and depression reflects the concurrence of two independent disorders. An alternative explanation is that PTSD is a variant of the mood disorders. A third

possibility is that the high rate of depression among PTSD patients may be an artifact of the overlap of the diagnostic criteria for these two disorders. Although symptom overlap is a general concern in assessing comorbidity (Frances et al., 1990), it is particularly salient for these two disorders. As defined in DSM-III-R (American Psychiatric Association, 1987) and DSM-IV (American Psychiatric Association, 1994), PTSD and major depression share three symptoms: diminished interest, difficulty sleeping, and difficulty concentrating and many associated features. Although there is endocrinological evidence that depression and PTSD are distinct disorders (Yehuda et al., 1993), further research is needed to clarify the issue of symptom overlap.

Our finding that PTSD is associated with the presence of other anxiety disorders is also consistent with the results of previous studies (*e.g.*, Boudewyns et al., 1991; Kulka et al., 1990) and may provide confirmatory evidence for the inclusion of this disorder among the anxiety disorders. In considering the implications of this comorbidity, however, it is important to note that these rates are not uniquely high. The overall rates of comorbid anxiety disorders among individuals with a primary diagnosis of an anxiety disorder (excluding PTSD) have been found to range from 50% to 70% (Sanderson et al., 1990).

In general, whereas the high rates of comorbidity in PTSD have been extensively discussed in the clinical and empirical literature, these rates have never been viewed within the context of the comorbidity found in other types of psychopathology. For instance, two large-scale community surveys of psychopathology have determined that over 50% of individuals who were assigned any one axis I diagnosis met criteria for two or more disorders (Kessler et al., 1994; Robins et al., 1991). Our results are somewhat consistent with this finding, as we determined that the prevalence rates of some disorders were roughly equivalent among our PTSD and our comparison group. Our study is limited, however, in that our comparison group was not a group identified as having a particular axis I disorder (such as depression). Given that there is a strong possibility that the comorbidity found in PTSD may be common to other primary axis I diagnoses, it will be essential for future research to include a psychiatric comparison group with an index disorder other than PTSD to ascertain whether PTSD is more likely to occur with other axis I disorders relative to other clinical syndromes (Keane and Wolfe, 1990). Further, acknowledging the similarity of patterns of comorbidity among patients with PTSD and those with other index disorders (such as depression or panic disorder) may allow the field to bring to bear assessment and treatment methodologies developed in other areas (Albus and Scheibe, 1993).

Although the increased prevalence of some axis I disorders such as the mood and anxiety disorders may not be specific to PTSD, it is important to begin to empirically test hypotheses directed toward understanding the relationship between PTSD and comorbid psychopathology. One limitation of this study is that, although our findings contribute to a body of strong empirical evidence that disorders such as PTSD and major depression are associated at a descriptive level, we are unable to ascertain from comorbidity data whether a) PTSD in some way predisposes or causes the development of major depression; b) depression predisposes or causes PTSD; c) both disorders are influenced by another underlying factor; or d) the relatively high base rate frequency of each disorder inflates comorbidity estimates (Frances et al., 1990). It has been proposed that depression is a common complication of patients with an anxiety disorder that develops when an individual moves from being unsure of whether they have control over the outcomes of important future events to being certain that they are helpless (Alloy et al., 1990). Indeed, there is some evidence that the onset of depression follows the onset of PTSD (Mellman et al., 1992). Nevertheless, there is empirical evidence suggesting an alternative causal direction that preexisting axis I diagnoses may increase the probability of being exposed to traumatic events (Breslau et al., 1991) and may contribute to the development of PTSD (Breslau et al., 1991; Green et al., 1990).

In addition to the limitations discussed above, perhaps the most important factor that should be considered when interpreting the data from this study is that we did not use a probability sampling strategy when selecting participants for the study. Thus, the generalizability of our findings is limited to service-seeking Vietnam veterans with similar demographic and psychopathological characteristics. It remains somewhat unclear as to whether patterns of comorbidity among veterans with war zone-related PTSD are similar to those displayed by individuals who experience others types of traumatic events. Certainly, the role of type of traumatic event, age and gender of the individual, and family history of psychopathology need further consideration in the study of comorbidity in PTSD.

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